

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the subject application.

Listing of Claims:

What is claimed is:

1. (Currently Amended) An electrosurgical device to treat tissue in a presence of radio frequency power and a fluid provided simultaneously from a distal portion of the device, the device having a proximal end and a distal end and comprising:

a handle;

a shaft extending from the handle, the shaft supporting an electrode tip in rigid relation to the handle and having a distal end;

a fluid passage being connectable to a fluid source of the fluid;

the electrode tip comprising an electrode ~~having an electrode surface~~, at least a portion of the electrode ~~[[tip]]~~ extending distally beyond the distal end of the shaft;

the portion of the electrode ~~[[tip]]~~ extending distally beyond the distal end of the shaft comprising an electrically conductive cone shaped portion, the cone shaped portion having a circular portion which narrows towards the distal end of the device along an electrically conductive cone shaped surface; and

at least one fluid outlet opening in fluid communication with the fluid passage.

2. (Currently Amended) The device according to claim 1 wherein:

the at least one fluid outlet opening is arranged to provide the fluid from the fluid source to the electrode ~~[[tip]]~~.

3. (Currently Amended) The device according to claim 1 wherein:

at least a portion of the ~~electrode~~ electrically conductive cone shaped surface has a contact angle (θ) with the fluid from the fluid source thereon of less than 90 degrees.

4. (Original) The device according to claim 1 wherein:
the at least one fluid outlet opening is located at the distal end of the shaft.
5. (Currently Amended) The device according to claim 4 wherein:
the at least one fluid outlet opening located at the distal end of the shaft is located between a portion of the electrode ~~[[tip]]~~ contained within the shaft and the distal end of the shaft.
6. (Previously Presented) The device according to claim 1 wherein:
the at least one fluid outlet opening is sheltered by the device from having direct contact with the tissue.
7. (Previously Presented) The device according to claim 6 wherein:
the at least one fluid outlet opening sheltered by the device from having direct contact with the tissue is sheltered by the shaft.
8. (Previously Presented) The device according to claim 1 further comprising:
means to shelter the at least one fluid outlet opening from having direct contact with the tissue.
9. (Original) The device according to claim 8 wherein:
the means to shelter the at least one fluid outlet opening comprises the shaft.
10. (Previously Presented) The device according to claim 1 further comprising:
a plurality of fluid outlet openings.
11. (Currently Amended) The device according to claim 10 wherein:

the plurality of fluid outlet openings are arranged to provide the fluid from the fluid source around the electrode ~~[[tip]]~~.

12. (Original) The device according to claim 10 wherein:
the plurality of fluid outlet openings are located at the distal end of the shaft.
13. (Previously Presented) The device according to claim 10 wherein:
the plurality of fluid outlet openings comprise four equally spaced openings located at the distal end of the shaft.
14. (Currently Amended) The device according to claim 1 further comprising:
at least one recess to provide a fluid flow channel for the fluid from the fluid source to flow distally along the electrode ~~[[tip]]~~.
15. (Currently Amended) The device according to claim 14 further comprising:
a plurality of recesses, each recess to provide a fluid flow channel for the fluid from the fluid source to flow distally along the electrode ~~[[tip]]~~.
16. (Original) The device according to claim 14 wherein:
the at least one recess is in fluid communication with the at least one fluid outlet opening.
17. (Original) The device according to claim 14 wherein:
the number of recesses is equal to the number of fluid outlet openings.
18. (Currently Amended) An electrosurgical device to treat tissue in a presence of radio frequency power and a fluid provided simultaneously from a distal portion of the device, the device having a proximal end and a distal end and comprising:
a handle;

a shaft extending from the handle, the shaft supporting an electrode tip in rigid relation to the handle and having a distal end;

a fluid passage being connectable to a fluid source of the fluid;

the electrode tip comprising an electrode ~~having an electrode surface~~, at least a portion of the electrode ~~[[tip]]~~ extending distally beyond the distal end of the shaft;

the portion of the electrode ~~[[tip]]~~ extending distally beyond the distal end of the shaft comprising a neck portion and an enlarged end portion, the enlarged end portion located distal to the neck portion and comprising an electrically conductive cone shaped portion, the cone shaped portion having a circular portion which narrows towards the distal end of the device along an electrically conductive cone shaped surface; and

at least one fluid outlet opening in fluid communication with the fluid passage.

19. (Currently Amended) The device according to claim 18, wherein:

the at least one fluid outlet opening is arranged to provide the fluid from the fluid source to the electrode ~~[[tip]]~~.

20. (Currently Amended) The device according to claim 18 wherein:

at least a portion of the ~~electrode~~ electrically conductive cone shaped surface has a contact angle (θ) with the fluid from the fluid source thereon of less than 90 degrees.

21. (Currently Amended) An electrosurgical device to treat tissue in a presence of radio frequency power and a fluid provided simultaneously from a distal portion of the device, the device having a proximal end and a distal end and comprising:

a handle;

a shaft extending from the handle, the shaft supporting an electrode tip in rigid relation to the handle and having a distal end;

a fluid passage being connectable to a fluid source of the fluid;

the electrode tip comprising an electrode ~~having an electrode surface~~, at least a portion of the electrode ~~[[tip]]~~ extending distally beyond the distal end of the shaft;

the portion of the electrode ~~[[tip]]~~ extending distally beyond the distal end of the shaft comprising a neck portion and an enlarged end portion, the enlarged end portion located distal to the neck portion and comprising an electrically conductive cone shaped portion, the cone shaped portion having a circular portion which narrows towards the distal end of the device along an electrically conductive cone shaped surface; and

at least one fluid outlet opening in fluid communication with the fluid passage, the fluid outlet opening arranged to provide a fluid from the fluid source to the neck portion of the electrode ~~[[tip]]~~.

22. (Currently Amended) The device according to claim 21 wherein:

at least a portion of the ~~electrode~~ electrically conductive cone shaped surface has a contact angle (θ) with the fluid from the fluid source thereon of less than 90 degrees.

23. (Currently Amended) An electrosurgical device to treat tissue in a presence of radio frequency power and a fluid provided simultaneously from a distal portion of the device, the device having a proximal end and a distal end and comprising:

a handle;

a shaft extending from the handle, the shaft supporting an electrode tip in rigid relation to the handle and having a distal end;

a fluid passage being connectable to a fluid source of the fluid;

the electrode tip comprising an electrode ~~having an electrode surface~~, at least a portion of the electrode ~~[[tip]]~~ extending distally beyond the distal end of the shaft;

the portion of the electrode ~~[[tip]]~~ extending distally beyond the distal end of the shaft comprising a neck portion and an enlarged end portion, the enlarged end portion located distal to the neck portion and comprising an electrically conductive cone shaped portion, the cone shaped portion having a circular portion which narrows towards the distal end of the device along an electrically conductive cone shaped surface; and

at least one fluid outlet opening in fluid communication with the fluid passage, the fluid outlet opening arranged to provide a fluid from the fluid source towards the enlarged end portion of the electrode ~~[[tip]]~~.

24. (Currently Amended) The device according to claim 23 wherein:

at least a portion of the ~~electrode~~ electrically conductive cone shaped surface has a contact angle (θ) with the fluid from the fluid source thereon of less than 90 degrees.

25. (Currently Amended) An electrosurgical device comprising:

a handle;

a shaft extending from the handle, the shaft supporting an electrode tip in rigid relation to the handle;

a fluid passage being connectable to a fluid source of a fluid;

the electrode tip comprising an electrode having ~~an electrode surface, and comprising~~ an electrically conductive cone shaped portion, the cone shaped portion having a circular portion which narrows towards the distal end of the device along an electrically conductive cone shaped surface; and

at least one fluid outlet opening in fluid communication with the fluid passage, the fluid outlet opening arranged to provide the fluid from the fluid source to the electrode ~~[[tip]]~~.

26. (Currently Amended) The device according to claim 25 wherein:

at least a portion of the ~~electrode~~ electrically conductive cone shaped surface has a contact angle (θ) with the fluid from the fluid source thereon of less than 90 degrees.

27.-39. (Cancelled)

40. (Currently Amended) The device of claim 1 wherein:

the electrode ~~[[tip]]~~ further comprises a distal end, and

the distal end of the electrode ~~[[tip]]~~ is blunt.

41. (Currently Amended) The device of claim 40 wherein:
the cone shaped portion of the electrode ~~[[tip]]~~ is located adjacent to the blunt distal end of the electrode ~~[[tip]]~~.
42. (Currently Amended) The device of claim 1 wherein:
the electrode ~~[[tip]]~~ further comprises a distal end, and
the distal end of the electrode ~~[[tip]]~~ is spherical.
43. (Currently Amended) The device of claim 42 wherein:
the cone shaped portion of the electrode ~~[[tip]]~~ is located adjacent to the spherical distal end of the electrode ~~[[tip]]~~.
44. (Currently Amended) The device of claim 42 wherein:
the spherical distal end of the electrode ~~[[tip]]~~ comprises a hemisphere of about 180 degrees.
45. (Previously Presented) The device of claim 1 wherein:
the cone shaped portion further comprises a concentric cone shaped portion.
46. (Previously Presented) The device of claim 1 wherein:
the cone shaped portion further comprises an eccentric cone shaped portion.
47. (Currently Amended) A surgical method for treating tissue comprising:
providing tissue having a tissue surface;
providing radio frequency power and a fluid to an electrosurgical device having a distal end portion which simultaneously provides the radio frequency power and the fluid to a tissue treatment site, the distal end portion comprising at least one fluid outlet opening and an electrode ~~[[tip]]~~ having an electrically conductive cone shaped portion, the cone shaped portion having a

circular portion which narrows towards the distal end of the device along an electrically conductive cone shaped surface;

providing the fluid from the electrosurgical device;

forming a localized fluid coupling with the fluid which couples the tissue surface and the electrode ~~[[tip]]~~, the fluid coupling localized at the distal end portion of the electrosurgical device;

providing the radio frequency power to the tissue;

moving the electrode ~~[[tip]]~~ of the electrosurgical device along the tissue;

coagulating the tissue; and

blunt dissecting the tissue with the cone shaped portion of the electrode ~~[[tip]]~~.